



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant : ALBRECHT, et al  
Serial No. : 09/937,810  
Filed : September 27, 2001  
For : COPOLYMERS BASED ON UNSATURATED MONO-  
OR DICARBOXYLIC ACID ..... AND USE THEREOF  
Art Unit : 1713  
Examiner : L. S. Choi

Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

**DECLARATION UNDER RULE 132**

Sir:

1. I am a co-inventor of the above referenced patent application and I am fully familiar with the patent application and the office actions which have issued in the course of its prosecution, including the office Action dated December 20, 2002.
2. I submit this declaration with the accompanying data in view of the Examiner's analysis of the application, particularly the Examiner's 35 U.S.C. § 103(a) rejection of claims 19-36 as allegedly obvious over U.S. Patent No. 5,798,425 (the '425 patent).
3. I am a co-inventor of the '425 patent.

4. The Examiner alleges that the copolymer of the '425 patent contains up to 50 mole percent acrylic acid aside from the structural units of Formulas I, II and III. However, the 50 mole percent of the '425 patent refers to the sum of the structural units of Formulas I, II and III. If this amount, however, is compared to as the sum of structural units (a), (b), (c) and (d) as claimed in the present application, the maximum content of acrylic acid is 33.3 mole percent.
5. At or under my direction, the following experiments were conducted to compare the copolymers of the present invention with those having less than the claimed content of acrylic acid.
6. Polymers having the following monomer components were prepared as follows according to the description of the application (Example 1):

Comparative Example 1 (not according to invention)<sup>b)</sup>

7.21 g (0.1 mole)	acrylic acid
196.00 g (0.098 mole)	methyldiethyleneglycol monovinyl ether
	(average mw 2,000 g/mole)
1.08 g ( $5.4 \times 10^{-4}$ mole)	reaction product of butyldiethyleneglycol
	block polypropyleneglycol (EO 4, PO 27)
	amine and maleic anhydride
11.50 g (0.1176 mole)	maleic anhydride

<sup>b)</sup>boundary example of US 5,798,425 with regard to amount of acrylic acid

Comparative Example 2 (according to the presently claimed invention)

10.25 g (0.1422 mole)	acrylic acid
158.00 g (0.079 mole)	MPEGMVE-2000 (mw = 2,000 g/mole)
0.87 g ( $4.35 \times 10^{-4}$ mole)	component 3 of Comparative Example 1
4.65 g (0.0474 mole)	maleic anhydride

**Comparative Example 3 (according to the presently claimed invention)**

11.53 g (0.16 mole)  
106.00 g (0.053 mole)  
0.584 g ( $2.92 \times 10^{-4}$  mole)

acrylic acid  
MPEGMVE-2000 (mw = 2,000 g/mole)  
component 3 of Comparative Example 1

The polymers had the molar compositions given in Table 1.

Table 1

Comparative Example	Molar Composition (mole%) <sup>1)</sup>			
	a)	b)	c)	d)
1 (US 5,798,425)	31.63 <sup>2)</sup>	31.00	0.17	37.20
2 (invention)	52.86	29.36	0.16	17.62
3 (invention)	75.02	24.84	0.14	0

<sup>1)</sup>according to nomenclature of present application

<sup>2)</sup>corresponds additionally to monomer acc. to US 5,798,425

The products were tested in standard mortar, transport concrete and finished concrete parts.

**A. Results for mortar (EN-917)**

Comparative Example	Amount <sup>1)</sup>	Slump (cm)	Air Content (vol%)
1	0.20	23.8	3.9
2	0.20	28.5	3.0
3	0.20	30.8	3.1
without additive	-	15.0	2.0

<sup>1)</sup>g of polymer solid per 100 g cement  
cement: CEM I 42.5 R Marmersdorf  
w/c: 0.50

B. Results for transport concrete

Comparative Example	Amount <sup>1)</sup>	Slump (cm)		Air (vol%)	Compressive Strength after (MPa) 24 h
		10 min	40 min		
1	0.20	55.5	50.0	2.4	12.2
2	0.20	62.3	59.8	2.0	15.0
3	0.20	67.8	60.3	1.9	15.8

<sup>1)</sup>g of polymer solid per 100 g cement  
 cement: CEM I 42.5 R Kiefersfelden  
 w/c: 0.50

C. Results for finished concrete parts

Comparative Example	Amount <sup>1)</sup>	Slump (cm)		Air (vol%)	Compressive Strength after (MPa) 24 h
		10 min	40 min		
1	0.20	53.0	47.8	1.9	38.4
2	0.20	59.8	56.0	1.2	42.8
3	0.20	61.5	58.8	1.5	44.0

7. The results of these experiments show that if the amounts of acrylic acid in the copolymers are below the range claimed by the invention, markedly reduced processing and curing properties can be observed both in mortar and in concrete. Only acrylic acid amounts of more than 50 mole percent in the copolymer cause significant increase in water reduction, processing with time and strength development.
8. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both,

under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,

By Gerard Altmeyer

Date February 4, 2004